DRAFT CSSG RECOMMENDATION

V.2.1.1 Criticality Safety Analyses for Hazard Category 1 or 2 Nuclear Facilities

Inadvertent criticality hazards must be considered in the hazards analyses during the development of a DSA. Paragraph 830.204 requires, in the preparation of a DSA, description of the design and work to be done, a systematic identification of hazards, evaluation of normal, abnormal, and accident conditions, derivation of hazard controls, definition of safety management programs necessary for safety, including a criticality safety program. All these elements, as may relate to criticality hazards, must be treated in a DSA. The specifics of these considerations will be dependent on the circumstances.

The DSA should include analysis of a postulated bounding criticality accident to determine the radiological consequences of such an event. The results of this analysis must be considered in developing hazard controls.

The overarching requirement of the DSA is to establish a system of controls that ensure that the requirements of DOE Order 420.1 and applicable ANSI/ANS Standards are met. Chief among these is the requirement that all operations must be shown to be subcritical under all normal and credible abnormal events. This is typically done in a criticality safety evaluation (CSE) that supports the DSA and is also part of the safety basis. The CSE documents the analysis that shows that operations will remain subcritical under all normal and credible abnormal conditions and establishes appropriate controls on operations (e.g. passive and active engineered controls and administrative controls). TSR level controls should be identified on a case by case basis and should be graded according to the guidance in DOE-STD-3009-00, Change Notice No. 1 with regard to the classification of controls.

Two DOE Standards apply to CSEs. An acceptable format for documenting CSEs is DOE-STD-3007-93 Change Notice No. 1. DOE reviews of CSEs should be performed in accordance with DOE -STD-1134-99.

The elements of the Criticality Safety Program that implement the requirements of DOE Order 420.1 and applicable ANSI/ANS Standards must be described in the DSA. For example, the requirements for the process that results in CSEs must be included in the DSA. DOE approves the criticality safety program and the processes for developing criticality safety related controls when it approves the DSA. DOE approval is not needed for individual CSEs. If a CSE results in the development of TSRs then DOE must approve the TSRs. Additionally, new or changed operations or conditions that impact criticality safety require that the USQ determination process consider the criticality accident hazard.